Testimony of Ben Roy
Mid-Atlantic Regional Manager
National Fire Protection Association
Before the
Senate Housing Sub-Committee
Commonwealth of Virginia
November 15, 2006

Good morning. Thank you for allowing me to speak before you today.

My name is Ben Roy, and I serve as the Mid-Atlantic Regional Manager for the National Fire Protection Association. I am here to provide comments for the committee's consideration regarding a proposal to amend the Code of Virginia to require installation of automatic sprinkler systems in existing buildings exceeding seventy-five feet in height in jurisdictions exceeding 50,000 population.

Buildings constructed higher than fire department equipment can reach present unique fire protection and fire extinguishment challenges. This type of building, usually greater than seventy-five feet in height, is commonly referred to as a high-rise building.

Early high rise building design relied on fire-resistant construction to protect the structural elements of the building from fire and the division of the building into several fire resistant compartments to limit the amount of fuel within a single fire area. It was thought that, with early detection, the fire department could intervene and extinguish the fire with limited damage; or if the fire was not extinguished, the fire pretty much would kill itself by using up all the fuel within the fire resistant fire compartment, limiting

damage to that compartment. Meanwhile, the fire resistive construction would protect the structural elements of the building, maintaining structural integrity.

This method of providing safety to the inhabitants and the building obviously contained some flaws i.e. often the fire department could not effectively intervene because their resources were utilized to evacuate the inhabitants of the building, or the fire was located on the upper floors and all the equipment had to be carried up several stories before an effective fire attack could be mounted, or the fire was growing at such proportions that it could not be rapidly contained. Fires were not always contained within the fire-resistive compartment due to human error such as propped open fire doors, breeched fire walls, faulty HVAC systems, shoddy construction, and the like. Additionally, fire often spread up the outside of the building, through the windows, from floor to floor. A major life safety concern in any fire is where do the products of combustion such as smoke and poisonous gases go? Most often, these gases moved upward throughout the building, making the upper floors untenable. Another major factor was the effect a 2000 degree fire had on the structural elements of the building.

It became increasingly obvious that tall buildings and their inhabitants needed to be protected in a manner that would keep small fires small and not let them get out of control. Ideally, the building would be protected in such a manner that not only would the fire remain small but in most cases the fire would be extinguished, while at the same time alerting the occupants of the emergency.

In the late 60's and early 70's, codes-making groups started looking toward the installation of automatic sprinkler systems in high rises as the method for providing this type of protection.

Why sprinkler systems?

Automatic Sprinkler Systems have had an outstanding record of reliability and are a proven life safety and property conservation tool.

The requirement to sprinkler all newly constructed high-rise buildings has now been in place for several years and has paid major dividends in reducing loss of life and property in these occupancies.

Unfortunately, these code requirements applied to NEW buildings only. This left a large inventory of existing high-rise structures without sprinkler protection.

As a result of major high-rise fires occurring in unsprinklered buildings in the late 1980's and early 1990's, including One Meridian Plaza in Philadelphia, The Los Angeles County Health Building and the Interstate Bank Building in Los Angeles there has been a major call for retro-fitting those existing high-rises that had been built before automatic sprinkler systems were required.

Some occupancies, such as hotels and motels, voluntarily sprinklered their inventory of high-rise buildings. Other building owners, from time to time, have also voluntarily

installed sprinkler protection. However, many property owners chose to maintain the status quo.

In 1992, the National Fire Protection Association's *NFPA 1, Fire Prevention Code* required all existing high-rises to be sprinklered. That code, now known as the *NFPA 1 Uniform Fire Code* continues to require this level of protection.

Many areas of the country have mandated retroactive installation of sprinkler systems to make these tall structures safe. You will hear a presentation today how one city, Louisville, Kentucky implemented this requirement.
The City of Richmond, in a very proactive manner, is asking you to allow them to bring their existing high rise structures up to a reasonable level of safety in the same manner.

Earlier, I spoke about how the decision to provide sprinkler protection to this type of building was based on the reliability and ability of automatic sprinkler systems.
That reliability is still there. Sprinklers are a proven life saving and property conservation tool. Let me share with you information taken from a 2005 report entitled: "*U.S. Experience with Sprinklers and Other Fire Extinguishing Equipment*" by Kimberly D. Rohr and John R. Hall, Jr of the Fire Analysis and Research Division of the National Fire Protection Association indicates the following:

- Between 1999 – 2002, Sprinklers were 93% effective. They failed to operate in 7% of structural fires, and two-thirds of those failures were because the

system had been shut off before the fire. Nearly all the failures were entirely or primarily problems of human error.

- The civilian death rate per 1,000 fires between 1989 – 1998 was 86% lower in fires with automatic extinguishing systems than in fires without them.
- Sprinklers prevent large loss-of-life incidents. NFPA has no record of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional, or residential building where the system was properly operating.
- When measured by the average number of dollars lost to direct property damage per fire between 1989 – 1998, reductions associated with automatic suppression equipment are illustrated by the following: 64% for manufacturing properties; 53% for stores and offices; 66% for health care occupancies; 91% for hotels and motels and an estimated 74% reduction for residential properties.
- The Extent of Flame Damage Annual Average between 1989 – 1998 in Apartments with an automatic sprinkler system were as follows: Damage confined to object of origin – 69%; and Damage confined to area of origin – 20%.

Flame damage was confined to the area of origin in 89% of the incidents.

- Water Damage – According to a fifteen year study done in Scottsdale, Arizona, on average, a fire sprinkler will use 25 gallons of water per minute to control a home fire opposed to the estimated 250 gallons that is used by firefighters which equals 8 ½-15 times more water than a sprinkler system. And this estimate is for a one-and-two family home, not a high rise where the amount

of water used by fire fighters in trying to control a fire in an unsprinklered occupancy would be many times greater.

Providing automatic sprinkler protection in all high-rise buildings is the right thing to do. We at NFPA support the efforts of the City of Richmond and ask you to act favorably upon their request. We stand ready to assist you and the City of Richmond in any way we can.

Thank you.